



# EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING ABG ANALYSIS AND ITS INTERPRETATION AMONG II AND III YEAR B.SC NURSING STUDENTS

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## ABSTRACT

Arterial blood gas (ABG) analysis is a blood test that measures the levels of many different gases in the oxygen rich blood. Some of these levels are measured directly; while others are calculated from the measurements of other gases. Since the nurses and student nurses in critical care units are more involved in ABG interpretation and as well as caring patients on ventilation, If they are able to interpret them in a correct way, it can prevent complications, avoid errors and help in the progress of Patients condition. Purpose of the study was to assess the effectiveness of Structured Teaching Programme on knowledge regarding ABG analysis and its interpretation among B.Sc nursing II year and III year students. 40 II year and III year B.Sc Nursing students were selected using convenient sampling technique. After obtaining the necessary permission from the concerned authorities, a pre-test was done on the participants with socio demographic proforma and multiple-choice statements. On the next day, Structured teaching programme was then given to the experimental group only. After two days gap, post-test was conducted with the same tools. Findings revealed that the mean post-test knowledge level of experimental group (24.10) was higher as compared with the pre-test score (14.10). Thus, the study revealed that the Structured Teaching Programme was effective in improving the level of knowledge of II and III year B.Sc Nursing students.

**KEYWORDS:** Structured Teaching Programme, ABG analysis and its interpretation, II and III year B.Sc Nursing students.

## INTRODUCTION:

An Arterial Blood Gas Analysis (ABGA) is a test that measures the Oxygen tension, Carbon dioxide tension, acidity, Oxyhemoglobin saturation, and Bicarbonate concentration in arterial blood. Such information is vital when caring for patients with critical illness, respiratory, or metabolic diseases<sup>1</sup>.

Arterial blood gas studies are concerned with the exchange of gases between the lungs and blood and between blood and tissues. An ABG can be safely and easily obtained and furnishes rapid and accurate information on how the lungs and kidneys are working. It is the single most useful laboratory test in patients with the respiratory and metabolic disorders<sup>2</sup>.

Since the nurses and student nurses in critical care units are more involved in ABG interpretation and as well as caring patients on ventilation, the nurses and student nurses have more knowledge. If they are able to interpret them in a correct way, it can prevent complications, avoid errors and help in the progress of Patients condition<sup>3</sup>.

Normal pH of blood is 7.35-7.45. PaO<sub>2</sub> has a normal range of 70-100 mm Hg and PaCO<sub>2</sub> is 35-45mm Hg; SaO<sub>2</sub> is 93-98%. HCO<sub>3</sub> has a normal value of 22-26meq/l<sup>4</sup>.

## Need for the study:

Knowledge on ABG analysis is important for nurses in treating critically ill patients because underlying acid base disturbances are inevitable in these patients. It plays a significant role in documenting and monitoring respiratory failure and to detect the presence and severity of Hypoxemia and Hypercapnea<sup>5</sup>.

Due to an increase in patient dependency, it is no longer unusual for nurses to be caring for patients who need frequent ABG analysis. Nurses are often the first members of the health care team to see ABG results, understand its significance and has the ability to decide when the medical staff needs to be informed<sup>6</sup>.

A study was conducted among student nurses to find the concept of acid base balance. It presented a step by step approach to Arterial Blood Gas analysis along with the components of ABG (pH, PaCO<sub>2</sub>, and HCO<sub>3</sub>), metabolic and respiratory abnormalities (Acidosis and Alkalosis) in relation to causes, signs and symptoms, concept and degree of compensation required, the five steps of ABG analysis and practice problems. The study concluded that the student nurses can analyse the ABG values confidently in order to make a wise choice regarding patient care<sup>9</sup>.

Despite marked efforts, experts suggest that patient safety has not substantially improved. Efforts to improve safety has been hindered in part by the difficulty in recognizing and reporting events that routinely occur in complex and the lack of expertise in critical care and patient safety. Because these failures are more challenging to identify, they will most certainly require more diverse and innovative reporting method<sup>7</sup>.

## Statement of the problem:

A Quasi experimental study to assess the effectiveness of Structured Teaching Programme on knowledge regarding ABG analysis and its interpretation with II

and III year B.Sc Nursing Students of Bombay Hospital College of Nursing, Indore.

## Objectives of the study:

- To assess the effectiveness of Structured Teaching Programme on knowledge regarding ABG analysis and its interpretation with II and III year B.Sc Nursing Students.
- To find the association between knowledge score with selected socio demographic variables.

## Assumption:

The study assumes that the Structured Teaching Programme may be an effective method to improve the knowledge regarding ABG analysis and its interpretation with the II and III year B.Sc Nursing students of Bombay Hospital College of Nursing, Indore.

## Hypotheses:

**H1:** There is a significant difference in the pre test and post test knowledge score after the administration of Structured Teaching Programme.

**H2:** There is an association between pre test knowledge score with selected socio demographic variables.

## Operational definitions:

**Effectiveness:** In this study, effectiveness refers to the degree to which Structured Teaching Programme achieve the desired effect in improving the knowledge regarding ABG analysis and its interpretation with II and III year B.Sc Nursing students.

**ABG analysis:** In this study, ABG analysis refers to a test done by puncturing an artery and drawing a small amount of blood, in order to measure the amount of oxygen, carbon dioxide and acidity (pH) of the blood

**Interpretation:** In this study, interpretation refers to an act of explaining the results of ABG analysis.

## Delimitation:

This study is delimited to 40 B.Sc Nursing II and III year students of Bombay Hospital College of Nursing, Indore.

## MATERIALS AND METHODS:

### Research Approach:

Quantitative approach was used for the present study.

### Research Design:

The research design adopted for the study was a non-randomized control group design.

### Variables used for the study:

The variables under the study include:

**Independent variables:**

In this study, Structured Teaching Programme on ABG analysis and its interpretation was the independent variable.

**Dependent variables:**

The dependent variable in the present study was knowledge of the II and III year B.Sc Nursing students

**Setting of the study:**

This study was conducted in Bombay Hospital College of Nursing, Indore.

**Population:**

The study population was B.Sc Nursing II and III year students.

**Sample and Sampling Technique:**

40 II year and III year B.Sc Nursing students of Bombay Hospital College of Nursing, Indore, who fulfilled the inclusion criteria were selected using Convenient Sampling Technique.

**Sampling Criteria:****Inclusion Criteria:**

- B.sc nursing students
  - a. who are willing to participate in this study.
  - b. who are available at the time of data collection.

**Exclusion criteria:**

B.Sc Nursing I year and IV year students of Bombay Hospital College of Nursing, Indore.

**Data Collection Process:**

To conduct the study, written permission was obtained from the authorities of Bombay Hospital College of Nursing, Indore. The study was conducted from 16/5/16 to 21/5/16. A total of 40 B.Sc Nursing II year and III year students of Bombay Hospital College of Nursing Indore, were selected for the main study.

Prior to the administration of multiple-choice statements, the investigator obtained the informed consent from the respondent and confidentiality was assured.

Initially, both the experimental group and control group did pre test with socio demographic proforma and multiple-choice statements. Then on the next day, the Structured Teaching Programme was given only to the experimental group for 1 hour. After two days gap, post-test was conducted with the same tools.

**RESULT AND DISCUSSION:****1. Description of the sample according to the demographic variables**

The data obtained on sample characteristics were analyzed by descriptive statistics. The frequency of B.Sc Nursing students by their socio demographic variables are presented in table

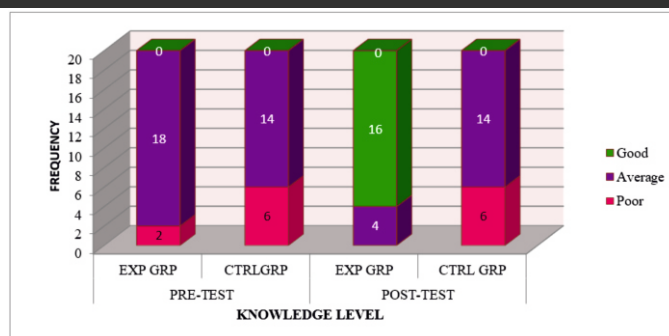
**Table 1: Description of sample according to demographic characteristics**

n = 40

Demographic Characteristics	Frequency	Percentage
Age (in years)	16-17	0
	18-19	13
	20-21	27
	Above 21	0
Religion	Hindu	1
	Muslim	1
	Christian	38
	Others	0
Area of Clinical Experience	ICU	14
	CCU	11
	Ward	9
	None of the above	6
Previous Knowledge	Workshops	4
	Seminars	14
	Conferences	1
	None of the above	21

**2. Assessment of level of knowledge of both the experimental and control group on ABG analysis and its interpretation**

This section deals with the assessment of level of knowledge of both the experimental and control group on ABG analysis and its interpretation. The level of knowledge is divided under following heading-poor, average, good.

**Figure 1: Multiple bar diagram showing the frequency of Level of knowledge score of experiment and control groups in pre-test and post test**

During the pre-test, in the experimental group, majority [90%] had average knowledge and 10% had poor knowledge; while in the control group, majority [70%] had average knowledge and 30% had poor knowledge.

During the post test, in the experimental group, majority [80%] had good knowledge and 20% had average knowledge; whereas in the control group, majority [70%] had average knowledge and 30% had poor knowledge. The mean difference of the experimental group was 10 and the mean difference of control group was 0.15.

**3. Effectiveness of structured teaching programme on ABG analysis and its interpretation**

This section deals with the effectiveness of Structured Teaching Programme on ABG analysis and its interpretation. The level of knowledge of the experimental group during the pre-test and post test was compared to prove the effectiveness of Structured Teaching Programme.

**Table 2: Effectiveness of Structured Teaching Programme on ABG analysis and its interpretation on the experimental group**

LEVEL	MEAN	S.D	df	Mean difference	't' VALUE
Pre test	14.10	2.808	19	10	14.293***
Post test	24.10	3.508			

\* $P \leq 0.05$  \*\* $P \leq 0.01$  \*\*\* $P \leq 0.001$

The mean post-test knowledge level of experimental group (24.10) was higher as compared with the pre-test score (14.7). The calculated t value was 14.293 and was more than the table value, 't' (2.09). Hence research hypothesis (H1) was accepted. It indicated that the Structured Teaching Programme was effective in increasing the knowledge level of B.Sc Nursing students at 5 % level of significance

**4. Association between the knowledge level with demographic variable****Table 3: Association between the knowledge level with demographic variables**

n = 40

Demographic Characteristics	≤ MEDIAN	≥ MEDIAN	Df	X <sup>2</sup>
Age	18-19	11	1	4.86
	20-21	13		
Religion	Hindu	01	2	2.171 N.S
	Muslim	00		
	Christian	23		
Area of Clinical Experience	ICU	06	3	5.09 N.S
	CCU	06		
	Ward	08		
	None of the above	04		
Access to Knowledge through	Workshops	03	3	1.66 N.S
	Seminars	09		
	Conferences	01		
	None of the above	11		

N.S- Non significance

Table No. 3 depicted that the 'P' value was more than 0.05. But in the age group there is significance in 4.086 at  $P \leq 0.05$ . Hence,  $H_2$  is accepted in the age group and in other areas it is rejected.

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